JONAS LIEBER

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Academic Positions

Imperial College London — 2024-
Assistant Professor in Economics and Public Policy

Yale University — 2023-24
Cowles Postdoctoral Fellow
Cowles Foundation and Center for Algorithms, Data and Market Design

Education

The University of Chicago — 2017-23
Ph.D. in Economics
Advisors: Alexander Torgovitsky (chair), Ali Hortaçsu, Azeem M. Shaikh, Max Tabord-Meehan
Thesis: "*Essays in Econometrics and Industrial Organization*"

Humboldt-Universität zu Berlin
M.Sc. in Mathematics — 2015-18
B.Sc. in Mathematics — 2012-16
B.Sc. in Economics — 2012-15

Université Paris 1 Panthéon-Sorbonne
M2 in Modélisation et Méthodes Mathématiques en Economie et Finance — 2016-17

Teaching and Research Fields

Primary: Econometrics
Secondary: Industrial Organization

Teaching Experience

Imperial College London

Spring 2025	Empirical Industrial Organization (Ph.D.)	
Autumn 2024	Machine Learning (UG)	

The University of Chicago

Spring 2022	Machine Learning for Econometrics (UG)	Grader for Prof. Bonhomme
Spring 2020	Topics in Econometrics (Ph.D.)	TA for Prof. Bonhomme
Winter 2020	Advanced Industrial Organization II (Ph.D)	TA for Prof. Hortaçsu
Fall 2019-21	Empirical Analysis (Ph.D)	TA for Prof. Shaikh

Humboldt-Universität zu Berlin

Summer 2017	Statistik I (UG)	TA for Dr. Klinke

Honors and Fellowships

2022-2023	Theodore W. Schultz Memorial Fellowship	University of Chicago
2017-2022	Neubauer Fellowship	University of Chicago
2016,2017	Deutschlandstipendium	IHK Berlin, BMBF
2017	Bachelorpreis	BMG e.V.

Professional Activities

Organization

2019, 2020	Empirics and Methods in Economics Conference
2019-2021	Industrial Organization Lunch, University of Chicago

Presentations

2025	University of Bonn, University of Bristol, Encounters in Econometric Theory
2024	Yale University, CEME Conference for Young Econometricians, London School of Economics
2023	University of Copenhagen, University of Surrey, Imperial College London, Universitat Pompeu Fabra, Paris School of Economics, Erasmus Universiteit Rotterdam, Columbia University, University of Georgia Terry School of Business, University of Rochester, Ludwig-Maximilians-Universität München, Queen Mary University of London, IAAE 2023 Annual Conference, Instacart, MIT/Harvard Econometrics Seminar
2022	Young Scholars Conference on Machine Learning in Economics and Finance, Federal Reserve Bank of Philadelphia ASSA Annual Meeting Session: "From Data to Decisions", Econometric Society
2020	Generalized Entropy Workshop, University of Copenhagen

Publications in Mathematics

"On the Well-Posedness of a Class of McKean Feynman-Kac Equations"
(with Nadia Oudjane and Francesco Russo, pre-Ph.D.)
Makrov Processes And Related Fields (2019, Issue 5)

Working Papers

"Estimating Concentration Parameters for Bandit Algorithms"

Bandit models are widely used to capture learning in contexts where agents repeatedly choose actions with uncertain rewards. Examples include firms maximizing profits by experimenting with prices or advertisement, randomized control trials maximizing outcomes by evaluating alternative treatments, and consumers maximizing utility by trying experience goods. A popular bandit algorithm is the upper confidence bound (UCB) algorithm. The UCB algorithm requires sub-Gaussian concentration parameters as inputs. In practice, these parameters are unknown so that the UCB algorithm is not fully data-driven. I propose a method to estimate these parameters and use the estimated parameters to conduct inference with Hoeffding's inequality. I show that asymptotic inference with estimated parameters is valid under mild and optimal under stronger conditions. In finite samples, I establish the validity of inference under an anti-concentration condition. Equipped with the proposed estimator for sub-Gaussian concentration parameters, I adapt the UCB algorithm to settings where these parameters are unknown. In an empirical application, I study price experimentation after the liberalization of the

spirits market in Washington State in 2012 and find that the adapted UCB algorithm leads to considerably higher profits. My theoretical results can also be applied to non-standard inference problems that arise in partial identification and machine learning.

"Demand Estimation with Finitely Many Consumers" (with Thomas Wiemann)

Although market shares are frequently estimated via averages of finitely many consumer choices, commonly applied methods for demand estimation are not robust to estimation error in these shares. While non-negligible estimation error in market shares always introduces bias in the demand parameter estimators, the issue becomes most salient when estimated market shares are zero. In the presence of zero shares, widely applied estimators of the random coefficient logit model cannot be computed without ad-hoc data manipulations. This paper proposes a new estimator of demand parameters for settings with endogenous prices and estimated market shares that is robust to zerovalued market shares. The estimator generalizes the constrained optimization program of Dubé et al. (2012) with probabilistic bounds on the estimation error in market shares. We show consistency as the number of markets T grows sufficiently slowly relative to the number of consumers n such that $\log(T)/n \to 0$, and provide confidence intervals under the same rate. Simulations suggest improved finite sample properties of the proposed estimator to conventional alternatives.

"Estimating Nesting Structures" (with Ali Hortaçsu, Julien Monardo and Áureo de Paula)

The nested logit model is commonly used to estimate demand in differentiated products markets. However, it and its generalizations require an assumed nesting structure. In this paper, we propose to estimate the nesting structure from the data. For this, we build on a recent generalization of the nested logit model that allows any possible nesting structure and is consistent with utility-maximization by heterogeneous consumers. In this setting, estimating the nesting structure amounts to estimating a linear model with many endogenous variables, which is challenging. We show theoretically and in simulations that non-negativity constraints coming from economic theory are sufficient to recover the nesting structure from data. In doing so, we explore the regularization properties of the non-negative least squares estimator as demonstrated in the statistical literature and expanded here to an instrumental variable context. This estimator may be of independent interest.

Languages

English (fluent), German (native), French (fluent), Spanish (basic)